AMENDMENTS TO THE CLAIMS

1-24. (Canceled).

25. (Currently Amended) Imaging optics defining an observation beam path with main optics comprising:

a plurality of optical elements, said main optics being chromatically corrected for an observation radiation, and said imaging optics further comprising a transmissive, diffractive element arranged in the observation beam path of the imaging optics and wherein, due to the diffractive effect of the diffractive element, at least one aberration of the main optics is chromatically corrected for an inspection radiation that is used for autofocusing of an image and having a different longer wavelength than that of the observation radiation that is used to observe an object, wherein the effect of the diffractive element does not substantially change the imaging properties of the imaging optics for the observation radiation.

26. (Cancelled)

27. (Previously Presented) The imaging optics as claimed in Claim 25, wherein the diffracted inspection radiation of a predetermined, non-zeroth order of diffraction is used for correction of said aberration.

28. (Previously Presented) The imaging optics as claimed in Claim 25, wherein the diffraction efficiency of the diffractive element for the zeroth order of diffraction of the observation radiation is greater than the sum of the diffraction efficiencies of all other orders of diffraction of the observation radiation.

29. (Previously Presented) The imaging optics as claimed in Claim 25, wherein the diffraction efficiency of the diffractive element for the zeroth order of diffraction of the observation radiation is at least 80%.

30. (Previously Presented) The imaging optics as claimed in Claim 25, wherein the diffractive element is a phase grating.

31. (Currently Amended) The imaging optics as claimed in Claim 25, wherein the diffractive element [[is]] <u>comprises</u> a grating having <u>rotational</u> symmetry <u>about an optical axis of the main optics</u>.

32. (Previously Presented) The imaging optics as claimed in Claim 31, in which the symmetry comprises rotational symmetry about the optical axis of the main optics.

33. (Previously Presented) The imaging optics as claimed in Claim 25, wherein the diffractive element comprises annular depressions which are concentric.

34. (Previously Presented) The imaging optics as claimed in Claim 33, wherein all the depressions have substantially the same depth.

35. (Previously Presented) The imaging optics as claimed in Claim 33, wherein the depth of the depressions decreases as the radial distance from the optical axis of the main optics increases.

36. (Previously Presented) The imaging optics as claimed in Claim 25, wherein the diffractive element is positioned on one side of a plane-parallel plate.

37. (Currently Amended) The imaging optics as claimed in Claim 25, wherein the diffractive element is ~~positioned~~ disposed on ~~an optically effective~~ a surface of a refractive optical element of the main optics.

38. (Previously Presented) The imaging optics as claimed in Claim 36, wherein the diffractive element is positioned only in an annular region on the side of the plane-parallel plate.

39. (Previously Presented) The imaging optics as claimed in Claim 37, wherein the diffractive element is positioned only in an annular region on the optically effective_surface of the optical element.

40. (Previously Presented) The imaging optics as claimed in Claim 25, wherein the diffractive element is a blaze grating.

41. (Previously Presented) The imaging optics as claimed in Claim 25, wherein the diffractive element has a blaze profile approximated in steps.

42. (Previously Presented) The imaging optics as claimed in Claim 25, wherein the diffractive element is arranged in the region where the observation radiation has the greatest beam diameter in the main optics.

43. (Previously Presented) The imaging optics as claimed in Claim 25, wherein the main optics comprise a second diffractive element which has a diffraction-enhancing and achromatizing effect for the observation radiation.

44. (Previously Presented) The imaging optics as claimed in Claim 43, wherein the diffraction efficiency of the second diffractive element for the zeroth order of diffraction of the observation radiation is greater than the sum of the diffraction efficiencies of all other orders of diffraction of the observation radiation.

45. (Previously Presented) The imaging optics as claimed in Claim 43, wherein the desired achromatization of the main optics for a wavelength region containing the wavelength of the observation radiation is caused substantially completely by the second diffractive element.

46. (Previously Presented) The imaging optics as claimed in Claim 43, wherein the second diffractive element comprises a transmission grating formed on one side of a plane-parallel plate.

47. (Previously Presented) The imaging optics as claimed in Claim 46, wherein the first diffractive element is positioned on one side of said plane-parallel plate, and the second diffractive element is positioned on the other side of the plane-parallel plate.

48. (Previously Presented) The imaging optics as claimed in Claim 43, wherein the second diffractive element comprises a transmission grating formed on an optically effective surface of a refractive optical element of the main optics.

49. (Previously Presented) The imaging optics as claimed in Claim 48, wherein the first diffractive element is provided on one side of said refractive optical element and the second diffractive element is provided on the other side of the refractive optical element.

50. (Previously Presented) The imaging optics as claimed in Claim 25, wherein all optical elements of the main optics and the first diffractive element are formed of a maximum of two different materials.

51. (Previously Presented) The imaging optics as claimed in Claim 25, wherein all optical elements of the main optics and the first diffractive element are formed of the same material.

52. (Previously Presented) The imaging optics as claimed in Claim 25, wherein all optical elements of the main optics and the first diffractive element are mounted without cement.

53. (Currently Amended) A method for the manufacture of imaging optics, comprising

computationally assembling a main optics comprising a plurality of optical elements corrected for a predetermined observation radiation;

computationally arranging a transmissive diffractive element in an observation beam path of the imaging optics and optimizing the transmissive diffractive element with regard to its phase function such that at least one chromatic aberration of the main optics is corrected by the diffractive effect of the diffractive element for an inspection radiation that is used for autofocusing and that has a different wavelength that is longer than that of an observation radiation used to observe an object, such that the diffractive element does not substantially change the imaging properties of the main optics for the observation radiation;

generating the optical data required for manufacturing the imaging optics thus computed; and

manufacturing the imaging optics on the basis of the generated optical data.

54. (New) The imaging optics as claimed in Claim 25, wherein the observation radiation has a wavelength in the ultraviolet spectrum and the inspection radiation has a wavelength in the infrared or visible spectrum.

55. (New) The method as claimed in Claim 53, wherein the observation radiation has a wavelength in the ultraviolet spectrum and the inspection radiation has a wavelength in the infrared or visible spectrum.

56. (New) The imaging optics as claimed in Claim 25, wherein the observation radiation has a first wavelength and the inspection radiation has a second wavelength and further wherein a difference between the first wavelength and the second wavelength is at least one hundred nanometers.

57. (New) The imaging optics as claimed in Claim 56, wherein the difference between the first wavelength and the second wavelength is at least four hundred nanometers.

58. (New) The method as claimed in Claim 53, further comprising computationally arranging the transmissive diffractive element in the observation beam path of the imaging optics and optimizing the transmissive diffractive element for a circumstance wherein the observation radiation has a first wavelength and the inspection radiation has a second wavelength and further wherein a difference between the first wavelength and the second wavelength is at least one hundred nanometers.

59. (New) The method as claimed in Claim 58, wherein the difference between the first wavelength and the second wavelength is at least four hundred nanometers.